



FACTORY - *Binary-Coded Entry*

LESSON PLAN

Objectives:

This activity is to be used as an introduction to polynomials. It will lead the student through a discussion of how numbers are represented. Students will understand the need and use of proper notation. After completing this lesson, students will be able to:

- write a decimal number as a polynomial expression.
- convert the decimal number to a binary number.
- write the binary number as a polynomial expression.

Course/Grade Level: Pre-Algebra,
Algebra I

Activity Procedure:

1. Read through the *Binary-Coded Entry* information section dealing with the decimal numbering system and explain how decimal numbers can be expanded into polynomials.
2. Have the students practice expanding the following decimal numbers:
 - a. 12,496
 - b. 2,053
 - c. 1,927,104
 - d. 59
3. Read through the *Binary-Coded Entry* Information section dealing with the binary number system. (Hint: It might be good to note that in binary notation, the remainder left after the last division is the first digit.)
4. Show how to convert each of the following decimal numbers to binary numbers.

Answers:

- | | |
|--------|-------------|
| a. 46) | a) 101110 |
| b. 12 | b) 1100 |
| c. 5 | c) 101 |
| d. 179 | d) 10110011 |

**Note: Have students check the answers by writing each binary number in expanded form.

5. Have the students work the *Binary-Coded Entry* activity in the *Time Engineers* game.
6. After the students find the correct code, have them practice converting the following decimal numbers to binary.

Answers:

- | | |
|--------|------------|
| a. 83 | a) 1010011 |
| b. 18 | b) 10010 |
| c. 65 | c) 1000001 |
| d. 101 | d) 1100101 |

**Note: Have students check their work by writing each binary number in expanded form.

Discussion / Questions:

- Are all computer commands written in numbers?
- How do you think that you could give a computer a RUN command?
- Do you think the Binary System is the only system a computer understands?

Extension:

- Students can research the octal and hexadecimal system. Have them report on their usage and careers that might use the systems.